Nanticoke Drinking Water System
2022 Annual Water Quality Report

January 1, 2022 – December 31, 2022

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Quality Management System Policy

The Corporation of Haldimand County owns, maintains and operates various drinking water systems. Haldimand County is committed to:

- Ensuring our drinking water systems comply with all current legislation and regulatory requirements for the safe supply of drinking water;
- Ensuring financial support is provided to maintain infrastructure integrity to allow safe and consistent delivery of drinking water to our water customers;
- Reviewing,maintaining and continually improving our Quality Management System and to communicate the Plan with our water customers.

Haldimand County

Haldimand County Quality Management System Summary

Haldimand County's Quality Management System (QMS) is legislated under the Drinking Water Quality Management Standard (DWQMS) through the Safe Drinking Water Act. To maintain operating authority accreditation, the Ministry of the Environment, Conservation and Parks (MECP) mandate tasks that must be completed annually. These activities include:

- Conducting an internal audit of the Quality Management System.
- Conducting a Management Review meeting.
- Participating in an external audit conducting by a third party Accreditation Body
- Updating the Quality Management System Operational Plan.
- Updating Council of the status of the County's Quality Management System.

The QMS Operational Plan was reviewed and updated in 2022, with focus on Document and Records Control (Element 5), change managment and Continual Improvement (Element 21) all while incorporating organizational changes within the County.

Internal audits were completed with support from Water and Wastewater Operations staff and Aclaims Environmental. No non-conformities were identified as a result of the internal audit. The audit report did note four areas for opportunities for improvement.

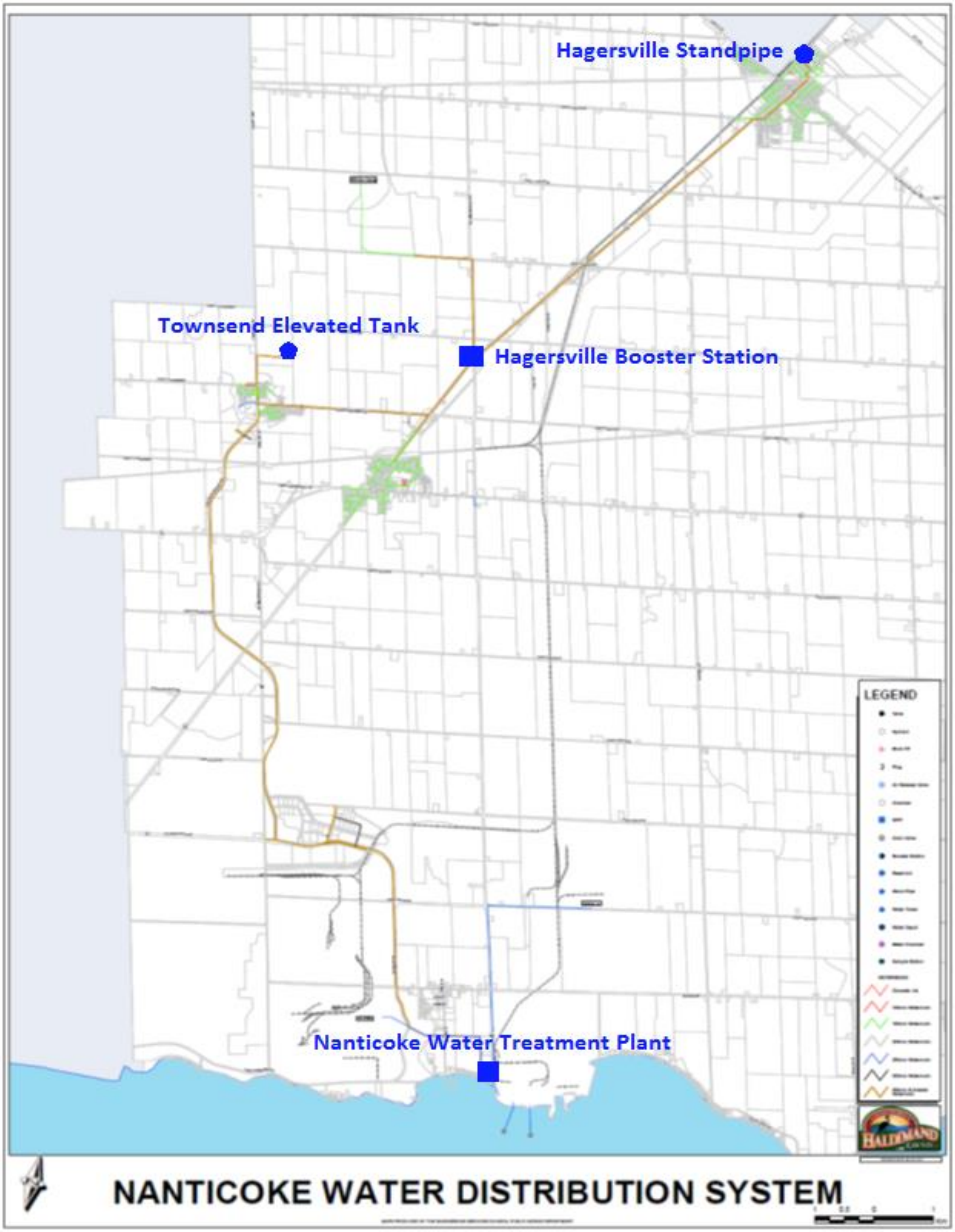
Haldimand County must receive accreditation annually to operate the water distribution systems. Through a qualified third party auditor, the County must demonstrate that its QMS (Quality Management System) meets the requirements of the DWQMS (Drinking Water Quality Management Standard). SAI Global conducted an external audit on December 1st, 2022. The County received one minor non-conformance. This was a result of an administrative issue and corrective action was implemented immediately to resolve the issue.

Staff are required to conduct an annual Management Review meeting to evaluate the effectiveness of the QMS. Deficiencies and opportunities for improvement are identified and action items are developed to ensure follow-up. The County held their management review meeting on December 14th, 2022.

All requirements were achieved in 2022 and SAI Global have issued an accreditation certificate to Haldimand County, which allows us to continue to operate the water distribution systems.

As part of the agreement with the County and through the regulations, Ontario Clean Water Agency (OCWA) must obtain accreditation to operate the water treatment facilities on behalf of the County. In 2022 OCWA obtained full scope accreditation under the requirements of DWQMS.

NANTICOKE DRINKING WATER SYSTEM



Nanticoke Drinking Water System Overview

Lake Erie raw water flows from the Ontario Power Generation forebay into the Nanticoke Industrial Pumping Station forebay. Raw water can be pre-chlorinated for zebra mussel control and then drawn into two raw water wet wells. Seven vertical turbine pumps are capable of supplying Imperial Oil and US Steel plants with raw water. Two submersible pumps supply the municipal treatment works with raw water.

A coagulant (poly-aluminum chloride was used in 2022) is injected into the raw water supply. Water flows into a high-rate clarification process (Actiflo), which uses microsand and polymer to improve floc formation and significantly reduce settling times. Settled water then flows to three filter units containing sand and anthracite. Filtered water is chlorinated with sodium hypochlorite for primary disinfection prior to flowing to two reservoirs. These reservoirs feed into a high lift pumping station, where chlorine is injected for secondary disinfection, before being pumped into the distribution system.

A settling lagoon collects waste water from various water treatment plant processes and continuously discharges to Lake Erie.

Figure 1 is a simplified schematic of the Nanticoke Water Treatment Plant. A larger version of the diagram is included in the appendices.

The distribution system is comprised of three residential communities (Townsend, Jarvis and Hagersville) and the Lake Erie Industrial Park. Townsend utilizes a water tower for storage and to maintain pressure in the distribution system. A booster station is utilized to maintain pressure and flow to Hagersville. As required, this facility has the capability to add sodium hypochlorite to the potable water to boost chlorine residuals. Hagersville utilizes a standpipe for storage and to maintain pressure in the distribution system. Bulk water stations are located in Hagersville and Jarvis. In addition, the Nanticoke Drinking Water System provides potable water to the Mississaugas of the Credit First Nation.

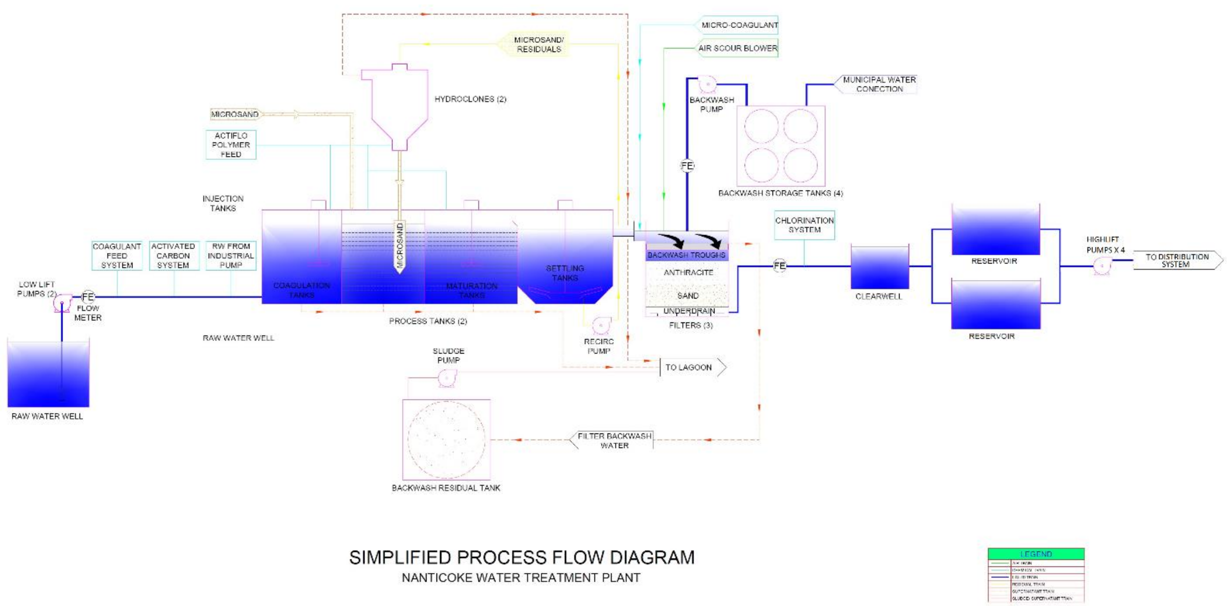


***Figure 1*: Nanticoke Water Treatment Plant Schematic**

The distribution system infrastructure services approximately 5,200 people (2021 Census).

Ontario Clean Water Agency is contracted to operate and maintain the raw water transmission mains, low lift pumping station, water treatment plant, and the standpipe. Haldimand County operates and maintains the distribution system, including the bulk water depots.

Expenditure Information

Haldimand County and its contract operators are diligent in prioritizing projects on an annual basis to eliminate unnecessary expenditure. Using the best available information at the time of this report, expenses incurred in the Nanticoke Drinking Water System for 2022 are identified in Table 1. Not all drinking water expenditure information is included in this report.

Table 1: Nanticoke Drinking Water System 2022 Expenditures

Nanticoke highlift chemical feed system replacement	$13,441
Townsend elevated tank isolation valve replacement	$20,794
Nanticoke lagoon cleanout	$17,421
Transmission main valve replacement	$20,000
Hagersville standpipe coating maintenance	$16,732
Filter valve actuator replacement	$14,124
Total	**$102,512**

Multi-Barrier Approach

Through the Walkerton Inquiry, Justice O'Connor recommended that drinking water is best protected by taking an approach that uses multiple barriers to prevent contamination from affecting our drinking water. The multi-barrier approach addresses potential threats by ensuring barriers are in place to either eliminate or minimize their impact. This holistic approach recognizes that each barrier may not be able to completely remove a contaminant, but by working together the barriers provide a high-level of protection. Typical barriers include:

- **Source Protection**
  - ***Source Protection Plans***
- **Treatment**
  - ***Treatment and Disinfection Goals***
- **Distribution System**
  - ***Residual Maintenance***
- **Monitoring**
  - ***Sampling Programs***
- **Emergency Preparedness**
  - ***Emergency Plans***

Haldimand County has adopted the multi-barrier approach in ensuring safe, reliable drinking water. Figure 2 shows how administration, design, maintenance, and operations work together to establish and maintain multi-barrier protection (US EPA, 1998).

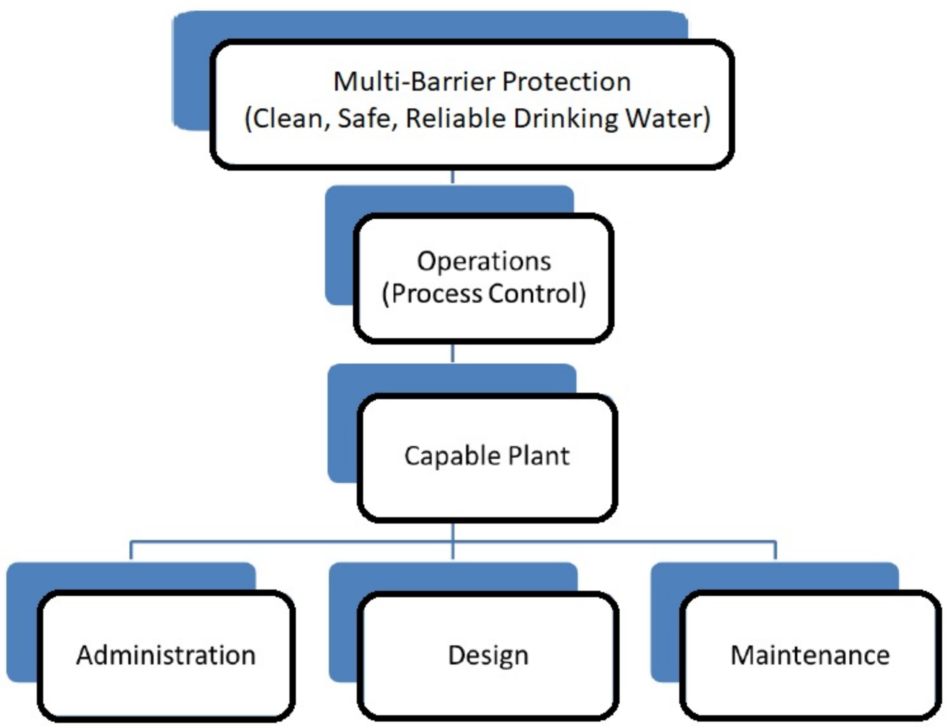


***Figure 2*: Responsibilities for Clean, Safe and Reliable Drinking Water**

A description of the responsibilities in each area is summarized as follows:

- **Administration**: The administrators or managers of a water treatment system are responsible for providing the resources (budget and staff) and policies (hours of staffing, reporting requirements, training and certification requirements, etc.). Funding may also need to be justified and obtained if the design of a system is inadequate or major upgrades are required. Managers establish and maintain emergency response plans and communication procedures to ensure prompt response to unsafe drinking water.

- **Design**: The designer's responsibility is to provide the physical infrastructure (pipes, valves, tanks, meters, etc.) capable of reliably producing and distributing the quality and quantity of water required. The design must provide adequate flexibility and controllability to enable the operator to make appropriate adjustments.

- **Maintenance**: The system must be maintained in good working order with the key equipment functional at all times. Should a key piece of equipment break down then it should be repaired in a timely manner.

- **Operations**: Once a capable system is in place, then it is the operator's responsibility to deliver safe drinking water through monitoring, testing and process control (for example by changing the setting on the dosing pumps). Operators are also responsible for maintaining records (log books, data forms, etc.), which aid in troubleshooting and design of upgrades. A further, and commonly unrecognized responsibility of the operator is to communicate the needs of the facility to administrators for possible action.

WATER SAMPLING

To comply with drinking water legislation, drinking water systems are required to monitor their water quality. Haldimand County has committed to providing safe, reliable drinking water and is diligent in ensuring that sampling and monitoring programs effectively characterize water quality. All samples are taken by certified operators and tests performed by accredited, licensed laboratories.

Microbiological Sampling

Microbial quality is one of the primary indicators for the safety of a drinking water supply. Of all contaminants in drinking water, human and/or animal feces present the greatest danger to public health. Pathogenic or disease causing microorganisms (including certain protozoa, bacteria or viruses) may be found in untreated water supplies. Bacteriological monitoring and testing is a way to detect and control pathogenic bacteria in treated drinking water supplies. Heterotrophic Plate Count (HPC) and background bacteria samples are monitored to identify potential changes in water quality and are not used as an indicator of adverse human health effects. Table 2 provides a summary of microbiological sampling completed in the Nanticoke Drinking Water System during 2022.

Table 2: 2022 Nanticoke Drinking Water System Microbiological Sampling

	Number of Samples	Range of E.coli Results (cfu/100ml)	Range of Total Coliform Results (cfu/100ml)	Number of HPC Samples	Range of HPC Results (cfu/ml)	Number of Background Samples	Range of Background Results (cfu/ml)
Raw	153	0 – 110	0– 3200	N/A	N/A	N/A	N/A
Treated	156	0	0	156	0 – 3	N/A	N/A
Industrial Park Distribution System	52	0	0	52	0-36	52	0-10
Townsend Distribution System	104	0	0	104	0 - 2	104	0-50
Jarvis Distribution System	52	0	0	52	0 – 20	52	0-11
Hagersville Booster Station	52	0	0	52	0 - 1	N/A	N/A
Hagersville Distribution System	104	0	0	104	0 – 4	104	0 -2

***Note**: At a minimum, 25% of all drinking water samples must be analyzed for HPC.

Operational Sampling

Operational sampling and monitoring is important in maintaining the integrity of each barrier in the multi-barrier approach. Schedules 7 and 8 of Ontario Regulation 170/03, specify requirements for operational checks that municipalities must follow. Table 3 provides a summary of operational samples taken for the drinking water system. Regulatory requirements were achieved for filtered water turbidity and efforts continue to consistently achieve settled and filter targets. Disinfection regulatory requirements and operational targets were consistently achieved in 2022.

Table 3: 2022 Nanticoke Drinking Water System Operational Sampling

	Number of Grab Samples	Range of Results	Regulatory Requirement	Recommended Target
Raw Turbidity	8760	0.92 – 92.9	N/A	N/A
Settled Turbidity	8760	0 – 4.9	N/A	1.00 NTU
Filtered Turbidity	8760	0.014- 0.062	≤ 0.30 in 95% of all monthly readings	0.10 NTU
Treated Turbidity	8760	0.02 – 0.58	N/A	≤ 5.00
Free Chlorine High Lift	8760	1.07 – 1.54	≥ 0.05 mg/L	≥ 0.20 mg/L
Free Chlorine Industrial Park	104	0.72 – 1.69 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
Free Chlorine Townsend	104	0.71 - 1.20 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
Free Chlorine Jarvis	104	0.68 – 1.22 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
Free Chlorine Hagersville Booster Station	365	0.87 – 1.46 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L
Free Chlorine Hagersville	104	0.40 – 1.23 mg/L	≥ 0.05 mg/L	≥ 0.20 mg/L

***Note**: 8760 is used for continuous monitoring.

Water treatment plant filters are backwashed to maintain or improve performance of the filters. The backwash water is discharged to a lagoon, which continuously discharges to Lake Erie. Municipal Drinking Water License number 066-102 specifies sampling requirements, summarized in Table 4, to monitor the discharge and ensure minimal impact to the natural environment.

Table 4: 2022 Nanticoke Water Treatment Plant Lagoon Sampling

Date of Legal Instrument Issued	Parameter	# of Samples	Annual Average (mg/L)	Regulatory Requirement
License 066-202 Dec 10, 2021	Backwash Lagoon Total Suspended Solids	53	3.6	Annual Average Concentration 25 mg/L

As result of public inquiries, a quarterly treated water hardness sampling program was initiated.

The term hardness was originally applied to waters that were hard to wash in, referring to the soap wasting properties of hard water. Hardness prevents soap from lathering by causing the development of an insoluble curdy precipitate in the water; hardness typically causes the buildup of hardness scale (such as seen in cooking pans). Dissolved calcium and magnesium salts are primarily responsible for most scaling in pipes and water heaters and can cause numerous problems in laundry, kitchen, and bath. Hardness is usually expressed in grains per gallon (or ppm) as calcium carbonate equivalent.

The degree of hardness standard as established by the American Society of Agricultural Engineers (S-339) and the Water Quality Association (WQA) is shown in the following table:

Table 5: Standard Degree of Hardness

Degree of Hardness	Grains per Gallon (gpg)	Ppm (mg/L)
Soft	< 1.0	< 17.0
Slightly Hard	1.0 – 3.5	17 – 60
Moderately Hard	3.5 – 7.0	60 – 120
Hard	7.0 – 10.5	120 – 180
Very Hard	> 10.5	> 180

The sample results in Table 6 indicate that the average values for Nanticoke is considered hard water as taken from the Degree of Hardness Table above.

Table 6: 2022 Nanticoke Drinking Water System Hardness Sampling

Parameter	Sample Date	Industrial Park	Townsend	Jarvis	Hagersville
Total Hardness (mg/L as $CaCO_3$)	February 15, 2022	122	120	110	121
	May 17, 2022	125	123	121	114
	August 16, 2022	162	142	138	125
	November 22, 2022	118	117	120	120
	2022 Average ------>	**132**	**126**	**122**	**120**

Lead Sampling

The community lead testing program is a requirement of O. Reg. 170/03 under the Safe Drinking Water Act, 2002. Haldimand County is exempt from sampling private residences due to having less than 10% of plumbing sample locations exceed the standard for two consecutive periods of reduced sampling. Annual pH and alkalinity samples are taken, as well as distribution system lead samples every three years. There are no regulatory limits for alkalinity and pH, however Haldimand County sample results are within the operational guidelines provided by the MECP. A summary of 2022 sampling has been provided in Table 7.

Table 7: 2022 Nanticoke Drinking Water System Lead Sampling

	Sample Type	Number of Samples	Range of Results	Number of Exceedances
Industrial Park	Plumbing - Lead	N/A	N/A	N/A
	Distribution - Lead	2	0.06-0.08 ug/L	N/A
	Distribution - Alkalinity	2	95-96 mg/L	N/A
	Distribution - pH	2	7.71-8.02	N/A
Townsend	Plumbing - Lead	N/A	N/A	N/A
	Distribution - Lead	2	0.07-0.12 ug/L	N/A
	Distribution - Alkalinity	2	98-99 mg/L	N/A
	Distribution - pH	2	7.87-8.14	N/A
Jarvis	Plumbing - Lead	N/A	N/A	N/A
	Distribution - Lead	2	0.08-0.09 ug/L	N/A
	Distribution - Alkalinity	2	97-99 mg/L	N/A
	Distribution - pH	2	7.89-8.14	N/A
Hagersville	Plumbing - Lead	N/A	N/A	N/A
	Distribution - Lead	2	0.04-0.12 ug/L	N/A
	Distribution - Alkalinity	2	98-100 mg/L	N/A
	Distribution - pH	2	7.94-8.18	N/A

Organic Sampling

To protect drinking water from pathogens, a disinfectant (usually chlorine) is added to the drinking water. Disinfectants can react with naturally-occurring materials in the water to form disinfection byproducts (DBP), which may pose health risks.

A challenge for water systems is balancing pathogen control and disinfection byproduct formation. It is important to provide protection from pathogens while minimizing health risks from disinfection byproducts. More information on each byproduct is summarized in Table 9.

Haldimand County sample for haloacetic acids (HAA) and trihalomethanes (THM) at the water treatment plant and in the distribution system where there is an elevated potential for the formation of these byproducts. Although a treatment sample and individual distribution system samples are not required by regulation, these samples are used to monitor byproduct formation within the drinking water system.

Table 8: Disinfection Byproduct Information

Disinfection Byproduct	How it is formed?	Health Effects
Trihalomethanes	Trihalomethanes occur when naturally-occurring organic and inorganic materials in the water react with the disinfectants, chlorine and chloramine.	Some people who drink water containing total trihalomethanes in excess of the MCL over many years could experience liver, kidney, or central nervous system problems and an increased risk of cancer.
Haloacetic Acids	Haloacetic acids occur when naturally-occurring organic and inorganic materials in the water react with the disinfectants, chlorine and chloramine.	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

Regulatory reporting is based on a running annual average of quarterly sample results using the worst case scenario. The calculated THM and HAA averages were below the maximum allowable concentrations (MAC) permitted by the MECP. Table 9 provides a summary of 2022 disinfection byproduct sampling.

Table 9: 2022 Nanticoke Drinking Water System DBP Sampling

Parameter	Sample Location	Sample Date	Sample Results (ug/L)	Annual Average (ug/L)	Regulatory MAC (ug/L)	Exceedance
Haloacetic Acids	Nanticoke WTP	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	6.0 12.1 22.9 21.2	15.5	80	**No**
	Industrial Park Distribution	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	6.6 13.8 22.4 17.6	15.1	80	**No**
	Townsend Distribution	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	13.9 15.4 27.0 17.4	18.4	80	**No**
	Jarvis Distribution	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	14.6 16.5 25.4 17.6	18.5	80	**No**
	Hagersville Distribution	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	16.7 17.1 28.1 29.5	22.9	80	**No**
Trihalomethanes	Nanticoke WTP	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	23 27 51 39	35	100	**No**
	Industrial Park Distribution	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	26 29 61 65	45.3	100	**No**
	Townsend Distribution	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	31 33 63 46	43.3	100	**No**
	Jarvis Distribution	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	29 36 71 45	45.3	100	**No**
	Hagersville Distribution	February 8, 2022 May 3, 2022 August 2, 2022 November 8, 2022	33 40 73 57	**50.8**[1]	100	**No**

[1] Result exceeded half the standard prescribed in Schedule 2 on the Ontario Drinking Water Quality Standards.

Additional sample results for organic and inorganic parameters are located in the appendices.

WATER USE

Raw Water

The Nanticoke Drinking Water System's raw water source is Lake Erie. A Permit to Take Water (PTTW) specifies the maximum volume of raw water that can be taken from the water source and conveys MECP site-specific regulatory requirements. Haldimand County has a large volume of available raw water capacity, however an interim limit of 437 MLD is in place until a number of conditions have been satisfied. When comparing the 2022 maximum raw water flow and the permit limits (Figure 3), 73% of Haldimand County's raw water allotment was available for use.

***Figure 3*: Nanticoke Permit To Take Water Flow Comparison**

Potable Water

As required by Schedule 22 of Ontario Regulation 170/03, Table 10, Table 11 and Figure 4 are intended to provide a summary of potable water supplied by the Nanticoke Drinking Water System in 2022.

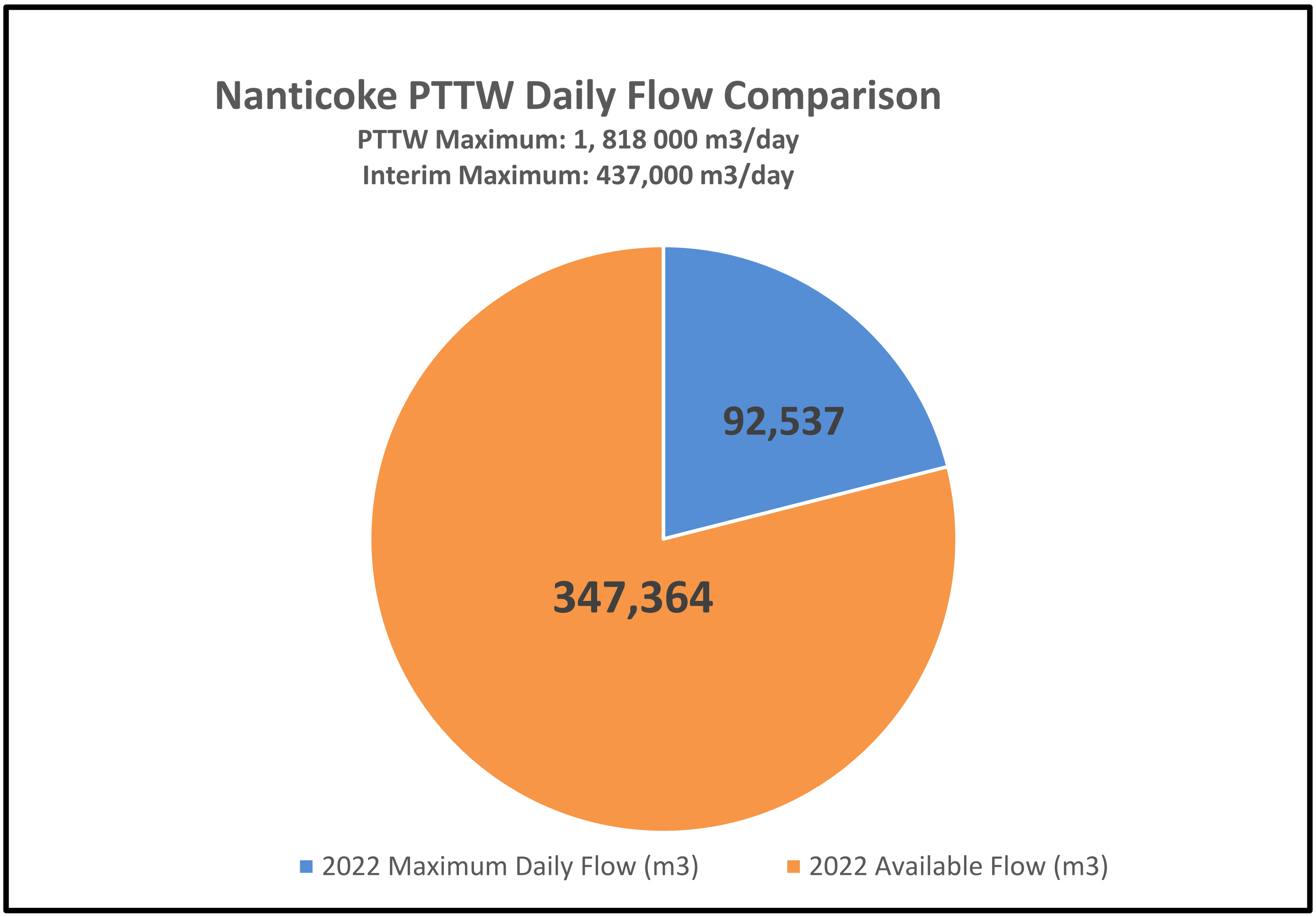


Table 10: 2022 Nanticoke Monthly Potable Water Flow Data

System	Month	Monthly Total m^3	Daily Average m^3/d	Maximum Daily Flow m^3/d	Maximum Daily Peak Flow L/s
Nanticoke Drinking Water System	January	204,826	6598	8187	94.8
	February	198,048	6518	9062	104.9
	March	214,631	6298	7949	92.0
	April	204,577	6356	7534	87.2
	May	264,173	7660	11889	137.6
	June	260,710	7846	9963	115.3
	July	255,837	7736	9544	110.5
	August	228,280	7331	8565	99.1
	September	229,813	6975	8739	101.1
	October	226,836	6655	7934	91.8
	November	226,692	7005	9809	113.5
	December	223,704	6606	8564	99.1

Figure 4 compares the monthly flows over the last five years at the Nanticoke Water Treatment Plant. When comparing the average monthly flows for 2021 and 2022, there was a 5.1% increase in potable water produced at the Nanticoke Water Treatment Plant.

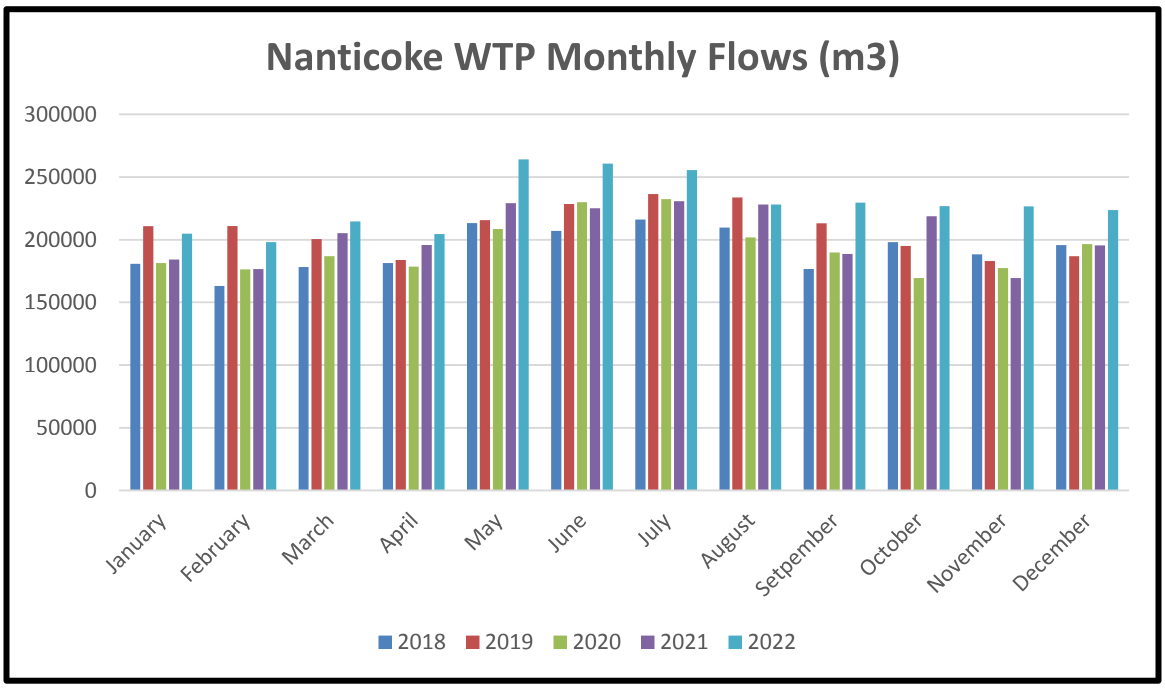


***Figure 4*: Nanticoke WTP Five Year Monthly Potable Flow Comparison**

The facility has a rated capacity of 13,636 cubic metres per day. When compared aganst the maximum daily flow for 2022, the Nanticoke Water Treatment Plant operated at approximately 87.2% of design capacity, however this calculation does not take into account any operational and infrastructure limitations.

Table 11: Comparison of Rated Capacity and 2022 Maximum Flow Rate

System and Municipal Drinking Water Licence	Rated Capacity (m^3/day)	Maximum Daily Flow (m^3)	Percentage of Capacity
Nanticoke 066-102	13,636	11,889*	87.2%

*A low pressure event in May 2022 caused water from the elevated Tank to be released. This resulted in a higher demand to refill the tank which accounts for the higher than average Maximum Daily Flow.

Average system water flows are approximately **6965 m^3/day**. This would represent 51% of rated capacity.

To ensure the water treatment facility is capable of meeting current and projected demands, Haldimand County staff annually review plant capability and performance and update development allocation accordingly

REGULATORY COMPLIANCE

Adverse Water Quality Incidents

Regulatory compliance requires reporting adverse water quality incidents to the Ministry of Health (MOH) and the MECP. In all instances, corrective action is initiated to resolve the issue.

Annual Drinking Water Inspection

The MECP annually confirms compliance with drinking water legislation by conducting inspections on drinking water systems. All aspects of the drinking water system are reviewed, including treatment equipment, disinfection, training records, and operational data required under the Safe Drinking Water Act, Ontario Regulations 170/03, 169/03 and 128/04. These inspections provide Haldimand County and OCWA an opportunity to review best management practices and work towards continually improving the operation and management of the drinking water systems. Any issues of regulatory non-compliance are identified and corrective actions issued.

The findings for the 2022 annual drinking water system inspections is included in this report. Below is a summary of the key findings for the inspection:

<u>Nanticoke Drinking Water System – DWS# 210001558</u>

There was one non-compliance identified during the 2022 inspection period. As a requirement of the Permit to Take Water, annual reporting is to be submitted to the Director by May 31st of the previous year. The inspection found that the 2021 water taking records required under Condition 4.1 were submitted late and the operations summary report required under Condition 4.2 were not submitted. The County received a **98.1%** inspection rating from the MECP.

Haldimand County continues to work closely with regulatory bodies to ensure a continued supply of safe, reliable drinking water to its users. All recommendations and corrective actions have been addressed and communicated to the MECP.

REPORT AVAILABILITY

This report can be viewed online at:

https://www.haldimandcounty.ca/drinking-water/

Reports can also be obtained upon request at the Haldimand County Administration Building:

Cayuga Administration Building
53 Thorburn St. South
Cayuga, ON
N0A 1E0

For more information on report content, please contact the Haldimand County Environmental Operations Division at:

Email: wwwops@haldimandcounty.on.ca

Telephone: 905-318-5932

Appendix A

Inorganic and Organic Sample Results

Inorganic Parameters:

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	March 14, 2022	ND	ug/L	No
Arsenic	March 14, 2022	0.4	ug/L	No
Barium	March 14, 2022	20.2	ug/L	No
Boron	March 14, 2022	19	ug/L	No
Cadmium	March 14, 2022	0.006	ug/L	No
Chromium	March 14, 2022	2.39	ug/L	No
Mercury	March 14, 2022	ND	mg/L	No
Nitrite	February 11, 2022 May 2, 2022 August 5, 2022	ND	mg/L	No
Nitrate	February 11, 2022 May 2, 2022 August 5, 2022	0.259 0.152 0.187	mg/L	No
Selenium	March 14, 2022	0.11	ug/L	No
Uranium	March 14, 2022	0.057	ug/L	No

ND = Not Detectable

Organic Parameters:

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	March 14, 2022	ND	ug/L	No
Atrazine + Metabolites	March 14, 2022	ND	ug/L	No
Azinphos-methyl	March 14, 2022	ND	ug/L	No
Benzene	March 14, 2022	ND	ug/L	No
Benzo(a)pyrene	March 14, 2022	ND	ug/L	No
Bromoxynil	March 14, 2022	ND	ug/L	No
Carbaryl	March 14, 2022	ND	ug/L	No
Carbofuran	March 14, 2022	ND	ug/L	No
Carbon Tetrachloride	March 14, 2022	ND	ug/L	No
Chlorpyrifos	March 14, 2022	ND	ug/L	No
Diazinon	March 14, 2022	ND	ug/L	No
Dicamba	March 14, 2022	ND	ug/L	No
1,2-Dichlorobenzene	March 14, 2022	ND	ug/L	No
1,4- Dichlorobenzene	March 14, 2022	ND	ug/L	No
1,2- Dichloroethane	March 14, 2022	ND	ug/L	No
1,1- Dichloroethylene	March 14, 2022	ND	ug/L	No
Dichloromethane (Methylene Chloride)	March 14, 2022	ND	ug/L	No
2,4- Dichlorophenol	March 14, 2022	ND	ug/L	No
2,4- Dichlorophenoxy acetic acid (2,4-D)	March 14, 2022	ND	ug/L	No
Diclofop-methyl	March 14, 2022	ND	ug/L	No
Dimethoate	March 14, 2022	ND	ug/L	No
Diquat	March 14, 2022	ND	ug/L	No
Glyphosate	March 14, 2022	ND	ug/L	No
Malathion	March 14, 2022	ND	ug/L	No
MCPA	March 14, 2022	ND	ug/L	No
Metolachlor	March 14, 2022	ND	ug/L	No
Metribuzin	March 14, 2022	ND	ug/L	No
Monochlorobenzene (Chlorobenzene)	March 14, 2022	ND	ug/L	No
Paraquat	March 14, 2022	ND	ug/L	No
Pentachlorophenol	March 14, 2022	ND	ug/L	No
Phorate	March 14, 2022	ND	ug/L	No
Picloram	March 14, 2022	ND	ug/L	No
Prometryne	March 14, 2022	ND	ug/L	No
Simazine	March 14, 2022	ND	ug/L	No
Terbufos	March 14, 2022	ND	ug/L	No
Tetrachloroethylene	March 14, 2022	ND	ug/L	No
2,3,4,6- Tetrachlorophenol	March 14, 2022	ND	ug/L	No
Total PCBs	March 14, 2022	ND	ug/L	No
Triallate	March 14, 2022	ND	ug/L	No
Trichloroethylene	March 14, 2022	ND	ug/L	No
2,4,6- Trichlorophenol	March 14, 2022	ND	ug/L	No
Vinyl Chloride	March 14, 2022	ND	Ug/L	No

ND = Not Detectable

Microcystin Sample Results

Parameter	Sample Date	Raw Water Results	Treated Water Results	Unit of Measure	Exceedance
Microcystin	May 23, 2022 June 6, 2022 June 13, 2022 June 20, 2022 June 27, 2022 July 4, 2022 July 11, 2022 July 18, 2022 July 25, 2022 August 1, 2022 August 8, 2022 August 22, 2022 August 29, 2022 September 6, 2022 September 19, 2022 September 26, 2022 October 3, 2022 October 10, 2022 October 17, 2022 October 24, 2022 October 31, 2022	0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	ug/L	No (less than minimum detection limit)

ND = Not Detectable